

That which is claimed is.

~~Patent Claims~~

Process to manufacture a cellulose fibre from hydrate cellulose which comprises the following steps:

- a) Treatment of wood pulp derived from shoots no older than 1 year of deciduous trees or conifers with an alkali metal hydroxide solution in order to obtain an alkali cellulose;
- b) pressing out of the superfluous alkali metal hydroxide solution from the obtained alkali cellulose;
- c) shredding of the alkali cellulose into crumbs;
- d) ripening of the alkali cellulose crumbs to a maturity of between 5° and 30° Hottenroth;
- e) application of the wet sulphide process to treat the ripened crumbs in order to sulphidise the cellulose;
- f) rinsing and diluting of the sulphidised cellulose with water in order to obtain a spinning solution;
- g) subsequent ripening of the rinsed and diluted cellulose to a maturity of between 5° and 30° Hottenroth;
- h) filtering and downstream deaeration of the spinning solution;
- i) injection of the spinning solution into a regenerating bath under application of spinnerets;
- j) stripping off the coagulating fibres with simultaneous twisting in order to obtain twisted fibres;

~~K) dehydrating of the twisted fibres;~~

~~I) desulphurisation of the twisted fibres;~~

~~m) washing of the twisted fibres with water;~~

~~n) predehydrating of the twisted fibres; and~~

~~o) drying of the twisted fibres.~~

2. Process in accordance with Claim 1, **characterised in that** the wood pulp derives from shoots no older than 1 year of false acacia trees, teak trees, bongassi trees or bamboo.

3. ~~Process in accordance with Claim 1, **characterised in that** the lignin content of the less-than-one-year-old shoots used does not exceed 7%, preferred is no more than 5%, and particularly favourable is no more than 2%.~~

4. Process in accordance with Claim 1, **characterised in that** the alkali metal hydroxide solution used to treat the wood pulp in Step a) is a sodium hydroxide solution which contains between 150 and 350 g/l of sodium hydroxide.

5. Process in accordance with Claim 4, **characterised in that** the sodium hydroxide solution contains approx. 300 g/l of sodium hydroxide.

6. Process in accordance with Claim 1, **characterised in that** treatment of the wood pulp in Step a) is carried out at a temperature ranging between 15°C and 25°C.

DOXT50-AZ258460

7. Process in accordance with Claim 1, **characterised in that** the shredding process of the alkali cellulose in Step c) comprises a coarse comminution step and a fine comminution step.
8. Process in accordance with Claim 1, **characterised in that** the alkali cellulose crumbs in Step d) are ripened at a temperature ranging between 60°C and 80°C.
9. Process in accordance with Claim 8, **characterised in that** the alkali cellulose crumbs are ripened at a temperature of between 65°C and 75°C.
10. Process in accordance with Claim 9, **characterised in that** the alkali cellulose crumbs are ripened at a temperature of approx. 72°C.
11. Process in accordance with Claim 1, **characterised in that** the alkali cellulose crumbs in Step d) are ripened to a maturity of between 8° and 12° Hottenroth.
12. Process in accordance with Claim 11, **characterised in that** the alkali cellulose crumbs are ripened to a maturity of about 10° Hottenroth.
13. Process in accordance with Claim 1, **characterised in that** the wet sulphide process in Step e) is carried out in a solution containing carbon disulphide, sodium hydroxide and Berol.
14. Process in accordance with Claim 13, **characterised in that** the carbon disulphide content of the solution is between 150 and 250 g/l and the sodium hydroxide content is between 250 and 350 g/l.
15. Process in accordance with Claim 14, **characterised in that** the carbon disulphide content of the solution is between 180 and 210 g/l and the sodium hydroxide content is between 280 and 320 g/l.

16. Process in accordance with Claim 1, **characterised in that** subsequent ripening of the cellulose in Step g) is carried out to a maturity of between 8° and 12° Hottenroth.

17. Process in accordance with Claim 1, **characterised in that** the spinning solution downstream of the subsequent ripening of the cellulose and upstream of the filtration of the spinning solution is mixed with at least one other spinning solution produced using a process which comprises Steps a) to g) as described in Claim 1.

18. Process in accordance with Claim 1, **characterised in that** the temperature of the regenerating bath in Step i) is between 35°C and 45°C.

19. Process in accordance with Claim 18, **characterised in that** the temperature of the regenerating bath is approximately 40°C.

20. Process in accordance with Claim 1, **characterised in that** the regenerating bath in Step i) contains between 70 and 160 g/l, preferably between 90 and 140 g/l, and ideally approximately 120 g/l of sulphuric acid.

21. Process in accordance with Claim 1, **characterised in that** the regenerating bath in Step i) contains between 0.3 and 4 g/l, preferably between 0.5 and 2 g/l, and ideally approximately 1 g/l of zinc sulphate.

22. Process in accordance with Claim 1, **characterised in that** the regenerating bath in Step i) contains between 0.05 and 1 g/l, preferably between 0.1 and 0.7 g/l, and ideally approximately 0.4 g/l of Berol.

23. Process in accordance with Claim 1, **characterised in that** the spinnerets in Step i) are heated to keep them at a temperature of between 55°C and 75°C.

24. Process in accordance with Claim 23, **characterised in that** the spinnerets are kept at a temperature of between 65°C and 70°C, and preferably at approx. 67°C.

25. Process in accordance with Claim 1, **characterised in that** the spinnerets in Step i) are oval to long-slit-shaped.

26. Process in accordance with Claim 1, **characterised in that** dehydrating of the fibres in Step k) is carried out with a sulphuric acid solution which contains up to 15 g/l of sulphuric acid.

27. Process in accordance with Claim 26, **characterised in that** the sulphuric acid solution used to dehydrate the fibres contains up to 10 g/l of sulphuric acid.

28. Process in accordance with Claim 1, **characterised in that** desulphurisation of the fibres in Step l) is carried out with a sodium sulphate solution which contains between 2 and 5 g/l of sodium sulphate.

29. Process in accordance with Claim 28, **characterised in that** the sodium sulphate solution used to desulphurise the fibres contains approximately 3 g/l of sodium sulphate.

30. Process in accordance with Claim 1, **characterised in that** the twisted fibres are treated with titanium dioxide after being washed with water and before being dehydrated.

31. Process in accordance with Claim 1, **characterised in that** the predehydrating of the fibres in Step n) is carried out with compressed air.

32. Process in accordance with Claim 1, **characterised in that** the drying of the fibres in Step o) is carried out under application of tunnel dryers.

Sub A1
33. Cellulose fibre, obtainable by a process in accordance with one of the Claims 1 to 32.

34. Cellulose fibre in accordance with Claim 33, **characterised by** a microstructure which displays fibre-parallel lamellae.

35. Cellulose fibre in accordance with Claim 34, **characterised in that** the spacing between the fibre-parallel lamellae ranges between 1 nm and 5 μm .

36. Cellulose fibre in accordance with Claim 35, **characterised in that** the spacing between the fibre-parallel lamellae ranges between 200 nm and 1 μm .

Sub A2
37. Fabric comprising a backing fabric and a pile woven into the backing fabric which contains the fibres in accordance with one of the Claims 33 to 36.

Sub A3
38. Fabric in accordance with Claim 37, **characterised in that** the backing fabric has a lattice-like structure.

39. Fabric in accordance with Claim 37, **characterised in that** the pile forms a fibre bed of approx. 0.5 cm in height above the backing fabric.

40. Fabric in accordance with Claim 37, **characterised in that** the backing fabric contains viscose staple fibres.

41. Fabric in accordance with Claim 40, **characterised in that** the backing fabric consists exclusively of viscose staple fibres.

42. Fabric in accordance with Claim 37, **characterised in that** the pile contains oval and tape fibres.

Sub A4
43. Fabric in accordance with Claim 42, **characterised in that** the pile consists of 50% oval fibres and 50% tape fibres.

Sub A3

- 44. Fabric in accordance with Claim 43, **characterised in that** the pile consists of 50% of oval fibres with a count of 330 dtex F60 and 50% of tape fibres with a count of 330 dtex F80.
- 45. Use of the fabric in accordance with one of the Claims 37 to 44 for cleaning and decontamination applications.
- 46. Use of the fabric in accordance with one of the Claims 37 to 44 to reduce the surface tension of water.
- 47. Use of the fabric in accordance with one of the Claims 37 to 44 to make textiles.
- 48. Use of the fabric in accordance with one of the Claims 37 to 44 to make clothing textiles.
- 49. Use of the fabric in accordance with one of the Claims 37 to 44 to make personal hygiene articles.
- 50. Use of the fabric in accordance with one of the Claims 37 to 44 as a particle filter.
- 51. Use of the fabric in accordance with one of the Claims 37 to 44 as a condensation catalyst.
- 52. Use of the fabric in accordance with one of the Claims 37 to 44 as a floor covering.
- 53. Use of the fabric in accordance with one of the Claims 37 to 44 as a covering material.

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